FA33 Motherboard

SBC with Freescale iMX6 Dual Core Processor

User Manual / Engineering Spec.

Version 1.1

FCC Statement

This device complies with part 15 FCC rules. Operation is subject to the following two conditions：

- This device may not cause harmful interference.
- This device must accept any interference received including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a class "a" digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at him own expense.

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Warranty

We warrant that each of its products will be free from material and workmanship defects for a period of one year from the invoice date. If the customer discovers a defect, We will, at its option, repair or replace the defective product at no charge to the customer, provided it is returned during the warranty period of one year, with transportation charges prepaid. The returned product must be properly packaged in its original packaging to obtain warranty service.

If the serial number and the product shipping data differ by over 30 days, the in-warranty service will be made according to the shipping date. In the serial numbers the third and fourth two digits give the year of manufacture, and the fifth digit means the month (e. g., with A for October, B for November and C for December).

For example, the serial number 1W11Axxxxxxxx means October of year 2011.

Declaration

- **Note!**

Winmate Products are shipped without root access to Android operating system. However, Winmate can provide support for access upon special request by contacting Winmate Sales

- **Caution!**

Rooting is a process that allows users to attain root access to the Android Operating System Code. It gives users privileges to modify the software code on the device or install any software without any permission. Any modifications to the system that could result in accidents where device can become beyond repair. Gaining root access also entails circumventing the security restrictions put in place by the Android operating system

Packing List

Before using this Motherboard, please make sure that all the items listed below are present in your package：

- FA33 Motherboard
- User Manual

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

Customer Service

We provide service guide for any problem as follow steps： The first, contact with your distributor, sales representative, or our customer service center for technical support if you need additional assistance. You may have the following information ready before you call：

- Product serial number
- Peripheral attachments
- Software (OS, version, application software, etc.)
- Description of complete problem
- The exact wording of any error messages

In addition, free technical support is available from our engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products. Please do not hesitate to call or e-mail us.

Safety Precautions

- **Warning!**

Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronic personnel should open the PC chassis.

- **Caution!**

Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

Safety and Warranty

1. Please read these safety instructions carefully.
2. Please keep this user's manual for later reference.
3. Please disconnect this equipment from any AC outlet before cleaning. Do not use liquid or spray detergents for cleaning. Use a damp cloth.
4. For pluggable equipment, the power outlet must be installed near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall could cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient over-voltage.
12. Never pour any liquid into an opening. This could cause fire or electrical shock.
13. Never open the equipment. For safety reasons, only qualified service personnel should open the equipment.
14. If any of the following situations arises, get the equipment checked by service personnel:
    A. The power cord or plug is damaged.
    B. Liquid has penetrated into the equipment.
    C. The equipment has been exposed to moisture.
    D. The equipment does not work well, or you cannot get it to work according to the user's manual.
    E. The equipment has been dropped and damaged.
    F. The equipment has obvious signs of breakage.
15. Do not leave this equipment in an uncontrolled environment where the storage temperature is below -40° C (-40°F) or above 70° C (157° F). It may damage the equipment.

Revision History

Version	Date	Note	Author
1.0	2015.04.13	First Release	Jimmy Chen
1.1	2015.09.01	CPU changed to dual core	Jimmy Chen

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CHAPTER 1

General Information

This chapter includes the FA33 Motherboard background information.

Sections include:

- Introduction
- Feature
- Motherboard Specifications
- Function Block
- Board Dimensions

Chapter 1 General Information

1.1 Introduction

FA33 SBC is an integrated package that provides customers a complete RISC platform for project evaluation, application development and solution feasibility testing that decreases lead-time and lowers initial cost and investment.

In peripheral connectivity, FA33 SBC features with two COM port, two USB 2.0 A-type connectors, one LAN port support PoE function, one DC input with Phoenix type terminal block, one Micro HDMI, one Micro SD card slot.

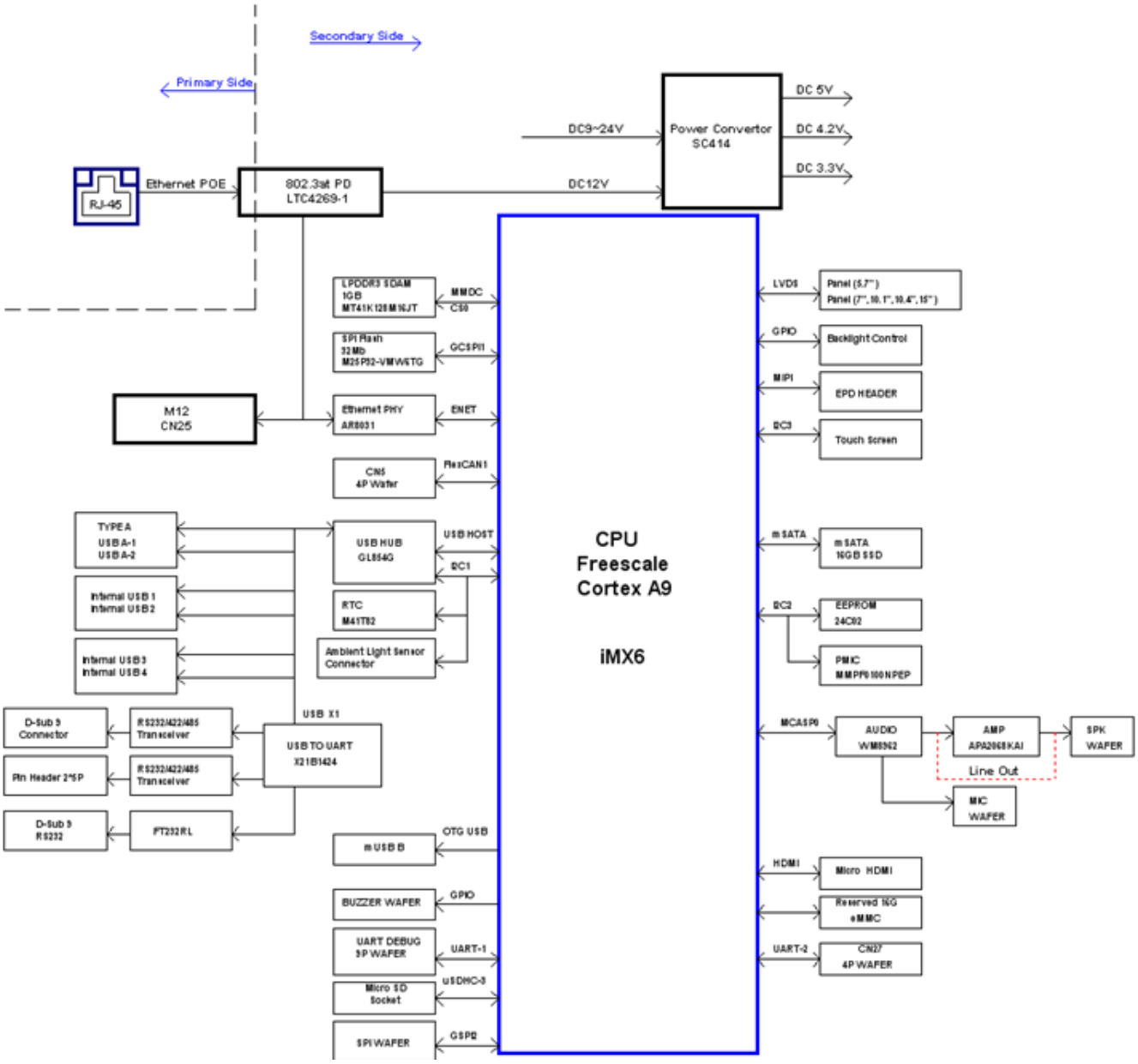
1.2 Feature

- 146 mm x 101 mm (3.5" Form Factor)
- Supports Freescale Cortex™ – A9 iMX6 Dual Core 1GHz processor (Optional for Quad Core)
- Android 4.4 / Linux supported
- LVDS interface by pin-header
- 1 x RJ-45 10/100/1000 LAN (Optional for PoE function)
- 2 x USB 2.0 A-type
- 1 x Micro SD Card Slot
- 1 x USB OTG
- 1 x Micro HDMI
- 1 x I2C touch supported(by pin-header)
- 1 x Digital I/O with 3.3V (8-PIN GPIO)
- 1 x CANbus by pin-header (non-isolation)-optional
- 1 x Reset by Pin-header (optional for reset button)

1.3 Motherboard Specifications

CPU Type	Freescale Cortex A9 iMX6 Dual Core (optional for Quad Core)
CPU Speed	1 GHz
LCD interface	LVDS interface
LAN	10/100 /1000 (Optional for PoE)
Memory Type	1GB DDR3
Storage	On Board 16GB eMMC /mSATA
External I/O	1 x 2.5Ø DC Jack 2 x USB A-type (Host) 2 x RS232/422/485 selectable 1 x RJ-45 10/100/1000 (Optional for PoE function) 1 x Micro SD Card Slot 1 x Micro HDMI 1 x USB OTG
Internal I/O	1 x LVDS by pin-header 1 x I2C Touch by pin-header 4 x USB by 2 pin-header (4 x 2 pin) 1 x RS232/422/485 by pin-header 1 x CANbus by pin-header (non-isolation) (optional) 1 x Digital I/O with 5V (8-pin GPIO) 1 x Reset by pin-header (optional for Reset button)
Dimensions	146 mm x 101 mm (3.5” form factor)
Mechanical & environmental	Operating temperature: -25 deg. C to 65 deg. C Operating Humidity: 10 ~ 90% Relative humidity, non-condensing
Power Input	DC IN 12V
Power Consumption	3W

1.4 Function Block



1.5 Platform Descriptions

1.5.1 Summary

Features	i.MX 6 Dual(Quad)
Core	Dual-Lite Cortex-A9
Memory	1GB DDR3
Storage	16G eMMC/mSATA/Micro SSD (up to 64GB)
L2 Cache	1 MB unified I/D L2 cache, shared by quad core
IPU	Two autonomous and independent IPUs
Graphics acceleration	Three independent, integrated graphics processing units: • OpenGL ® ES 2.0 3D graphics accelerator with four shaders • 2D graphics accelerator • Dedicated OpenVG^{tm} 1.1 accelerator

1.5.2 **System Memory:** 1.35V DDR3L SDRAM

Parameter	512 Meg x 4	256 Meg x 8	128 Meg x 16
Configuration	64 Meg x 4 x 8 banks	32 Meg x 8 x 8 banks	16 Meg x 16 x 8 banks
Refresh count	8K	8K	8K
Row address	32K A[14:0]	32K A[14:0]	16K A[13:0]
Bank address	8 BA[2:0]	8 BA[2:0]	8 BA[2:0]
Column address	2K A[11, 9:0]	1K A[9:0]	1K A[9:0]

1.5.3 **LAN Chip:** AR8031 integrated 10/100/1000 Mbps Ethernet Transceiver

1.5.4 **HD Audio Codec:** WM8962 Ultra-Low Power Stereo CODEC with Audio Enhancement

CHAPTER 2

Installations

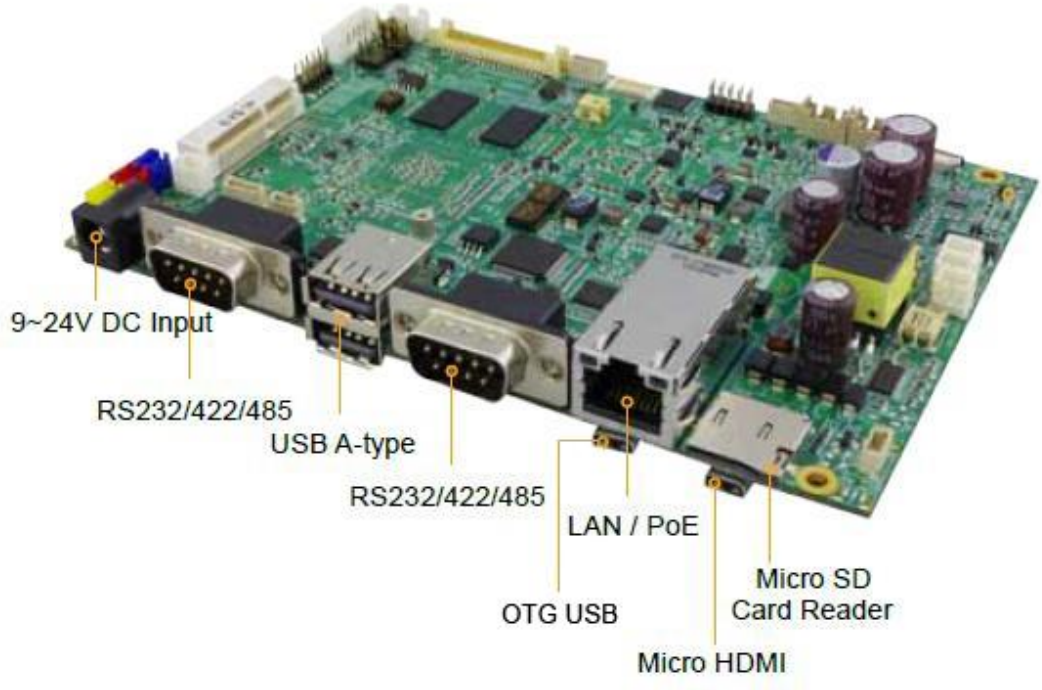
This chapter provides information on how to use the jumps and connectors on the FA33 Motherboard.

The Sections include:

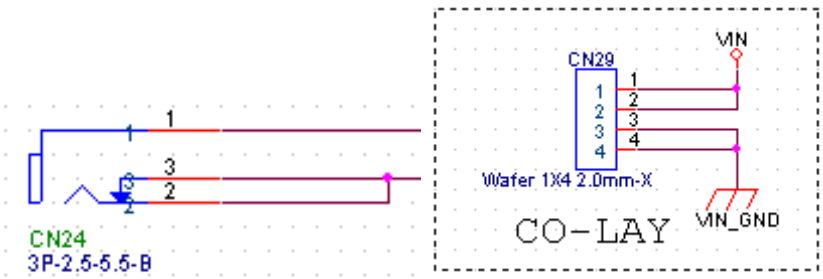
- I / O Connector Description
- Jumpers Setting Description

Chapter 2 Installations

2.1 I/O Connector Description



2.1.1 DC Jack (CN24) Power Conn (CN29)

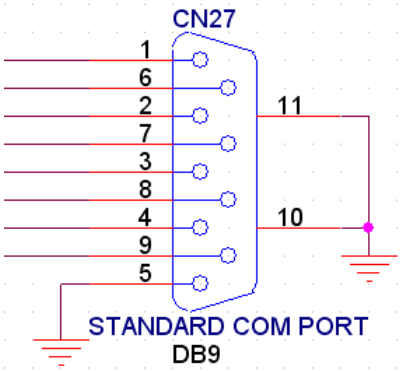


CN24	
Pin No	SYMBOL
1	VIN
2	GND
3	GND

CN29	
Pin No	SYMBOL
1	VIN
2	VIN
3	GND
4	GND

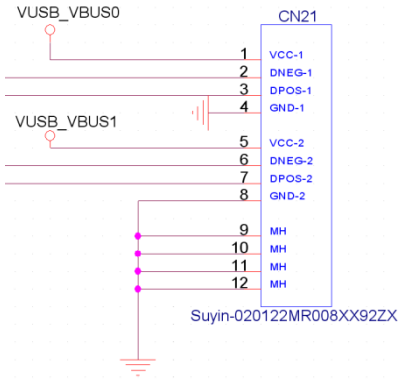
※ **VIN:12V**

2.1.2 D-Sub 9 COM Port (CN27 & CN28)



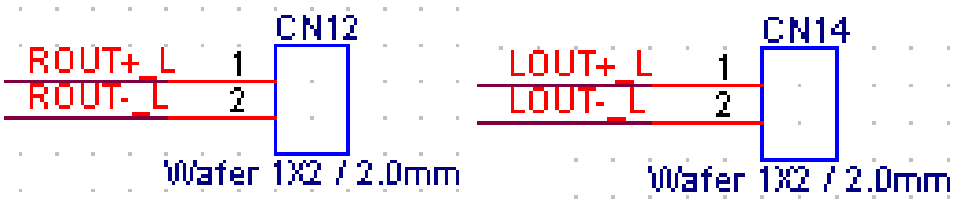
Pin No	SYMBOL
1	DCD
2	SIN
3	SOUT
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI(5V)
10	GND
11	GND

2.1.3 External USB 2.0 (CN21)



Pin No	Symbol	Pin No	Symbol
1	5V	7	DP
2	DM	8	GND
3	DP	9	GND
4	GND	10	GND
5	5V	11	GND
6	DM	12	GND

2.1.4 Speaker Out (CN12 & CN14)



CN12		CN14	
Pin No	SYMBOL	Pin No	SYMBOL
1	ROUT+_L	1	LOUT+_L
2	ROUT-_L	2	LOUT-_L

2.1.5 MIC connector (CN10)

Pin Assignment	
No	Name
1	MIC_IN +
2	MIC_IN -

2.1.6 HDMI Connector (HDMI 1)

Pin Assignment			
No	**Name**	**No**	**Name**
1	HP_DET_OUT	2	NC
3	HDMI_D2P	4	GND
5	HDMI_D2M	6	HDMI_D1P
7	GND	8	HDMI_D1M
9	HDMI_D0P	10	GND
11	HDMI_D0M	12	HDMI_CLKP
13	GND	14	HDMI_CLKM
15	HDMI_CEC_OUT	16	GND
17	H_CLK_OUT	18	H_DAT_OUT
19	HDMI_5V	20	GND

2.1.7 Backlight Connector (JP2)

Connector type: Wafer 7 PIN pitch 2.0 mm

Pin Assignment			
No	**Name**	**No**	**Name**
1	+BKLPWR	5	BRIGHTNESS
2	+BKLPWR	6	GND
3	+BKLPWR	7	Backlight enable
4	GND		

Refer to JP4 jumper setting for brightness mode select.

2.1.8 **LVDS connector (CN4)**

Connector Type : DF13 20pin pitch 1.25mm

Pin Assignment			
No	**Name**	**No**	**Name**
1	LCDVDD	2	LVDS0_TX0_N
3	LCDVDD	4	LVDS0_TX0_P
5	LCDVDD	6	LVDS0_TX1_N
7	GND	8	LVDS0_TX1_P
9	GND	10	LVDS0_TX2_N
11	GND	12	LVDS0_TX2_P
13	GND	14	LVDS0_CLK_N
15	GND	16	LVDS0_CLK_P
17	GND	18	LVDS0_TX3_N
19	GND	20	LVDS0_TX3_P
21	GND	22	LVDS1_TX0_N
23	GND	24	LVDS1_TX0_P
25	GND	26	LVDS1_TX1_N
27	GND	28	LVDS1_TX1_P
29	GND	30	LVDS1_TX2_N
31	GND	32	LVDS1_TX2_P
33	GND	34	LVDS1_CLK_N
35	GND	36	LVDS1_CLK_P
37	GND	38	LVDS1_TX3_N
39	GND	40	LVDS1_TX3_P
41	GND	42	GND
43	NC	44	NC

2.1.9 **Internal USB 2.0 Connector (USB 1 , USB 2)**

Connector type : 2*4p Wafer, P:2.0mm

Pin Assignment (USB 1)			
No	**Name**	**No**	**Name**
1	VUSB_VBUS5	2	VUSB_VBUS4
3	USB_PN5	4	USB_PN4
5	USB_PP5	6	USB_PP4
7	GND	8	GND

Pin Assignment (USB 2)			
No	**Name**	**No**	**Name**
1	VUSB_VBUS3	2	VUSB_VBUS2
3	USB_PN3	4	USB_PN2
5	USB_PP3	6	USB_PP2
7	GND	8	GND

2.1.10 mSATA card slot (CN15)

Connector type : mini-PCIE slot, H: 6.8mm

No	Name	No	Name
1	NC	2	+V3.3S
3	NC	4	GND
5	NC	6	+V1.5S
7	NC	8	NC
9	GND	10	NC
11	NC	12	NC
13	NC	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	NC
21	GND	22	NC
23	SATA_RXP1	24	+V3.3S
25	SATA_RXN1	26	GND
27	GND	28	+V1.5S
29	GND	30	NC
31	SATA_TXN1	32	NC
33	SATA_TXP1	34	GND
35	GND	36	NC
37	GND	38	NC
39	+V3.3S	40	GND
41	+V3.3S	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	+V1.5S
49	SSD_LED#	50	GND
51	NC	52	+V3.3_3G
m1	GND	m1	GND
m2	GND	m2	GND

2.1.11 **RJ45 POE connector (LAN1)**

Pin Assignment (FAN1)			
No	**Name**	**No**	**Name**
1	TRCT3	2	MDI2-
3	MDI2+	4	MDI1+
5	MDI1-	6	GND
7	TRCT4	8	MDI3+
9	MDI3-	10	MDI0-
11	MDI0+	12	TRCT1
13	PoE_A1+	14	PoE_A1-
15	PoE_A2+	16	PoE_A2-
17	LAN1_1000_O	18	LAN1_100_10_G
19	GND	20	LAN1_ACTIVE_Y
21	GND	22	GND
23	NC	24	NC

Internal COM (CN1)			
No	**Name**	**No**	**Name**
1	IO_DCDC#	2	IO_DSRC#
3	IO_SINC	4	IO_RTSC#
5	IO_SOUTC	6	IO_CTSC#
7	IO_DTRC#	8	IO_RIC# OR 5V
9	GND	10	GND

2.1.12 **Debug Connector (J1)**

Pin Assignment	
No	**Name**
1	NC
2	NC
3	TXD233
4	NC
5	NC
6	RXD232
7	DBUG_VBUS
8	GND

On / Off Connector (CN22)	
No	**Name**
1	NC
2	CPUPWRON
3	GND
4	GND
5	GND
6	GND
1	NC
2	CPUPWRON

Reset Connector (CN25)	
No	**Name**
1	+V3.3S
2	PWRON
3	GND
4	GND
5	GND
6	GND

2.1.13 CAN BUS Connector (CN3)

Pin Assignment			
No	**Name**	**No**	**Name**
1	+V_CAN_A	2	CAN1_RX
3	CAN1_TX	4	GND
5	GND	6	GND

2.1.14 UART Connector (CN19)

Pin Assignment			
No	**Name**	**No**	**Name**
1	VUART	4	GND
2	UARTTXD	5	GND
3	UARTRXD	6	GND

2.1.15 **Buzzer Connector (CN16)**

Connector type : 2 x 10pin box header, pitch 2.0mm

Pin Assignment			
No	**Name**	**No**	**Name**
1	+v12s or +v5s	2	GND

2.1.16 **MIPI Camera Connector (CON1)**

Pin Assignment			
No	**Name**	**No**	**Name**
1	LED_FLASH+	2	GND
3	GEN_2V8	4	GND
5	GEN_2V8	6	GND
7	CSI_SCL	8	CSI_SDA
9	CSI_RST_B	10	NC
11	GND	12	GND
13	CSI_PWN	14	GND
15	GND	16	MIPI_CSI_D1P
17	MIPI_CSI_D1M	18	GND
19	MIPI_CSI_CLKP	20	MIPI_CSI_CLKM
21	GND	22	MIPI_CSI_D0P
23	MIPI_CSI_D0M	24	GND
25	MCLK_1V8	26	GND
27	GEN_2V8	28	GEN_1V8
29	GND	30	LED_FLASH-

2.1.17 **DIDO Connector (CN9)**

Connector type : Header 2 x 5pin, P:2.0mm

Pin Assignment			
No	**Name**	**No**	**Name**
1	GND	2	DIO +5V
3	DOUT3_L	4	DOUT1_L
5	DOUT2_L	6	DOUT0_L
7	DIN3_L	8	DIN1_L
9	DIN2_L	10	DIN0_L

2.1.18 **Light Sensor Connector (CN7)**

Pin Assignment			
No	**Name**	**No**	**Name**
1	+5V	2	NC
3	LED_B#	4	Light_PWR
5	LED_R#	6	LED_G#
7	GND	8	LS_DATA
9	LS_CLK	10	GND
11	NC	12	INT

2.1.19 **SPI Connector (CN18)**

Pin Assignment			
No	**Name**	**No**	**Name**
1	+V3.3S	2	ECSPI3_MISO
3	ECSPI3_MOSI	4	ECSPI3_CS1
5	ECSPI3_SCLK	6	GND
7	GND	8	GND

2.1.20 **OTG (CN32)**

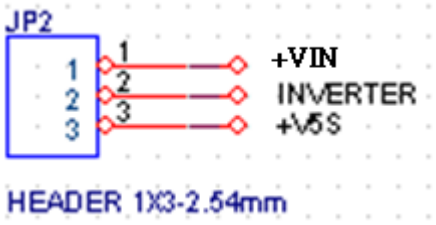
Pin Assignment			
No	**Name**	**No**	**Name**
1	VUSB_VOTG	2	USB_OTG_CON_DN
3	USB_OTG_CON_DP	4	USB_OTG_ID
5	GND	6	GND
7	GND	8	GND
9	GND	10	NC
11	NC		

2.2 Jumper Setting Description

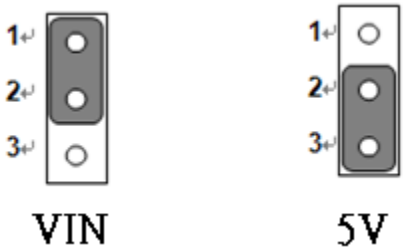
2.2.1 Boot Modes (SW1)

PIN1	PIN2	
0	0	Boot from fuses (default)
0	1	Serial downloader
1	0	Boot from board settings
1	1	Reserved

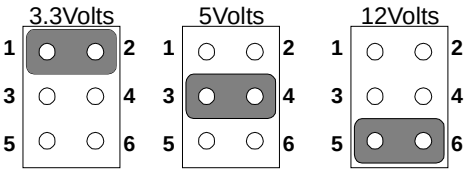
2.2.2 Backlight power selector (JP2)



NO	Name
1	VIN
2	INVERTER
3	+V5S



2.2.3 Panel Power Selector (JP1)



2.2.4 **Brightness Adjust Mode Selector (JP4)**